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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/660,065	09/08/2003	James M. Hildreth	1094-32	6187

7590 10/18/2006
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EXAMINER

DANG, THUAN D

ART UNIT PAPER NUMBER

1764

DATE MAILED: 10/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/660,065

Applicant(s)

HILDRETH ET AL.

Examiner

Thuan D. Dang

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 19-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Newly submitted claims 19-23 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: the newly added claims are directed to a combination process with extra steps which are not required in the original claims.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 19-23 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Fallon (5,602,290).

The claimed process is claimed as a process of alkylation of benzene with a dilute ethylene derived from a cracking reaction **before** this dilute stream is an ethylene/ethane fractionator to save the cost of separation of ethane from ethylene (see the preamble of the claims; pages 7-10 of the specification). In other words, the claimed process is only using a dilute ethylene stream which contains both ethylene and ethane for the alkylation of benzene to produce ethylbenzene instead of a pure ethylene stream (after ethane has been removed).

Using such a dilute stream has been used broadly in the industry. For example, Fallon discloses using a dilute ethylene (ethane is not removed) as an alkylating agent for alkylation of benzene to produce ethylbenzene (the abstract; col. 4, line 17 thru col. 5, line 11). Clearly, Fallon uses a dilute ethylene stream without separation of ethane for the alkylation.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the admitted prior art by using a portion of the dilute ethylene stream before the ethylene/ethane fractionator and or from a draw-stream of the fractionator as the alkylating feed since such a feed containing ethylene and an acceptable amount of ethane can be used as the alkylating feed as taught by Fallon.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the modified process by condensing the dilute ethylene

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stream to liquefy the alkylating stream to meet the condition of the alkylation reaction if the process is operated in the liquid phase.

Fallon does not disclose how much the ethylene is present in the pretreated dilute ethylene stream. However, as disclosed on column 4, lines 25-29, ethane is an inert material in the alkylation reaction. Therefore, It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the modified process by using a pretreated dilute ethylene having any amount of inert materials would yield similar results. Further, it has been held by the patent law that the selection of reaction parameters such as temperature and concentration would have been obvious. More particularly, where the general conditions of the claimed are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller* 105 USPQ 233, 255 (CCPA 1955). *In re Waite* 77 USPQ 586 (CCPA 1948). *In re Scherl* 70 USPQ 204 (CCPA 1946). *In re Irmischer* 66 USPQ 314 (CCPA 1945). *In re Norman* 66 USPQ 308 (CCPA 1945). *In re Swenson* 56 USPQ 372 (CCPA 1942). *In re Sola* 25 USPQ 433 (CCPA 1935). *In re Dreyfus* 24 USPQ 52 (CCPA 1934).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the modified prior art by selecting a location on the side of ethylene/ethane fractionator to withdraw a dilute ethylene stream having an appropriate amount of ethane for the alkylation since at different locations on the side of the distillation column, streams have different amounts of ethane and ethylene.

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the prior art process to recycling ethane to cracking for producing additional ethylene.

Recovering and recycling of product and unreacted reactant is obvious and taught by Fallon (figure 1).

On the paragraph bridging columns 5 and 6, Fallon discloses using a transalkylation step for converting the polyethylbenzene to ethylbenzene.

Response to Arguments

Applicant's arguments filed 8/4/2006 have been fully considered but they are not persuasive.

The argument that the so called "admitted prior art" relates only to directing an ethylene-containing stream to an ethylene fractionator for separating ethylene from ethane is not persuasive since claim 1 is recited in a Jepson format. As known, all recited in the preamble of the claim are admitted by applicants as prior art teaching. In the preamble, applicants admitted "a process for the production of ethylbenzene from a dilute ethylene stream wherein an ethylene-containing stream derived from the cracking of hydrocarbon feed is directed to an ethylene fractionator for separation of ethylene and ethane". Therefore, the claimed process is only a modification from a prior art process in which the dilute ethylene stream is liquefied and separated out a portion of ethylene-containing stream before the fractionator and/or drawing off a side stream from the ethylene fractionator.

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The argument that one cannot, using applicants' own disclosure as a guide, engage in hindsight reconstruction by picking and choosing certain features of one reference with selected features of another to reproduce applicants' claimed invention is not persuasive since as discussed in the above rejection, Fallon discloses using a dilute ethylene (ethane is not removed) as an alkylating agent for alkylation of benzene to produce ethylbenzene (the abstract; col. 4, line 17 thru col. 5, line 11). Clearly, Fallon uses a dilute ethylene stream without separation of ethane for the alkylation. In other words, using a dilute ethylene prior the separation of this dilute stream as the alkylating agent is known by Fallon not by applicants. Therefore, it is incorrect to say this feature is coming from the present specification as a hindsight. This feature is actually taught by Fallon.

The argument that an advantage of the present invention is to save capital and energy cost in the ethylene/ethane fractionation step is not persuasive since the Fallon alkylation process does not require a fractionated ethylene stream. Therefore, once the dilute ethylene stream is used for the alkylation, the cost of separation is minimized.

The argument that Fallon does not even disclose or suggest the separation of the dilute stream into two portion one for an ethylene/ethane fractionator because all of the ethylene is sent to the alkylator 12 for complete conversion is not persuasive since the rejection of the present claim is a combination of the admitted prior art process (cited in the preamble) and the teaching of using a dilute ethylene stream taught by Fallon. Therefore, the modified process is a process having a fractionator and a dilute ethylene stream (unseparated) used as the alkylating agent.

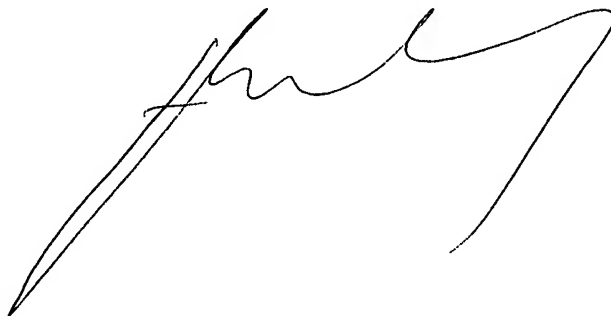
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thuan D. Dang whose telephone number is 571-272-1445. The examiner can normally be reached on Mon-Thu.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Thuan D. Dang
Primary Examiner
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A handwritten signature in black ink, appearing to be 'Thuan D. Dang', written in a cursive style.